

A REVIEW OF THE SPECIES *CALADENIA CARNEA* R.Br. (ORCHIDACEAE).

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This variable terrestrial orchid occurs in all Australian States except Western Australia, where its record is very doubtful. Mr. C. A. Gardner, Government Botanist, Perth, writes: "I can find no specific reference to it by Rogers, although when I submitted the list of the Orchidaceae for my 'Enumeratio' to him, he left this species in as Western Australian. It is not in the Goadby Collection, nor is it in the Perth Herbarium. If you cannot find any published account of its occurrence here (apart from mine and Mrs. Pelloe's), I think that I would delete it from the Western Australian flora."

It extends (in the form of two small varieties) to New Zealand, is of doubtful occurrence in New Caledonia, and according to a personal communication from the late Dr. Rogers, *C. carnea* var. *gigantea* is found as far north as Java.

In the present writer's opinion, it is inadvisable to include in this species any form which entirely lacks the characteristic *transverse red striae* on the labellum and/or column. It is one of the most variable of all our terrestrial orchids; but in all the forms which I recognize as mere variants, this transverse striation is a constant feature, except in rare isolated specimens which are obviously abnormal. It is clear, then, that I cannot accept *C. carnea* var. *aurantiaca* Rogers (*Trans. Roy. Soc. S. Aust.*, xlv, 1922, 154); and later in this paper will be found my reasons for raising this variety to specific rank.

It is desirable here to discuss the synonymy of *C. carnea* as given by Bentham (*Fl. Aust.*, vi, 386). In my "Orchids of New South Wales", 1943, 63, I followed Bentham in accepting *Arethusa catenata* Sm. (*Caladenia catenata* (Sm.) Druce, *Rep. Bot. Exch. Cl. Brit. Is.*, 1916, 611) as a synonym. But a subsequent study of Smith's plate and description (in the Mitchell Library at Sydney, *Exot. Bot.*, ii, 1804, 89, t. 104), has altered my opinion on the matter. The colouring of the flower in Smith's plate (mauve shading to deep purple, with a *blue labellum*) is nowhere else on record as occurring in *C. carnea*, but although colour is not to be ignored, great importance cannot be attached to it in a variable species. However, in addition to colour, the following distinctive points about Smith's flower preclude its acceptance as a representation of *C. carnea*:

- (1). The perianth is conspicuously dotted with dark spots.
- (2). The labellum is not lobed.
- (3). The margins of the labellum are entire.
- (4). The calli of the disc are shown prostrate and overlapping, in two chain-like rows (hence, perhaps, the name *catenata*).
- (5). At the base of the labellum are 4 tall calli similar to those of *C. tutelata* Rogers.
- (6). No transverse striae on either column or labellum.

What, then, is *C. catenata* (Sm.) Druce? Except for the narrow-linear leaf it could be taken as a slightly inaccurate representation of *C. tutelata* Rogers. I certainly think it should be deleted as a synonym of *C. carnea* R.Br.

As further synonyms of *C. carnea*, Bentham cites *C. alata* R.Br. and *C. angustata* Hook. f. The reference in both cases to Hooker's *Fl. Tasm.*, ii, t. 125, leads to the conclusion that both must be ruled out as synonyms of the present species. In the first place, Lindley—not Hooker—was the author of the name *C. angustata*; and

*C. angustata* Lindl. is a perfectly valid species (see W. H. Nicholls, *Vict. Nat.*, xlvii, 1931, 158). Next, there is definitely something erroneous in Hooker's plate. The figure over the name *C. alata* is an excellent representation of *C. angustata* Lindl., while that above the latter name does not depict Lindley's species. Whether it correctly represents Brown's *C. alata* I cannot say, since no authentic specimens bearing this name are available in Australia. But in a personal communication to me, W. H. Nicholls suggested its identity with the plant then known as *C. alpina* Rogers; and with this suggestion I agree. Recently, however, it has transpired that *C. alpina* Rogers is identical with *C. Lyallii* Hook. f., formerly supposed to be endemic in New Zealand (see these PROCEEDINGS, lxx, 1945, 57, footnote). Since neither *C. Lyallii* nor *C. angustata* can be included in *C. carnea*, Bentham's synonyms of the latter must be dropped.

Bentham recognized two named varieties of *C. carnea*—*C. carnea* var. *alba* and *C. carnea* var. *quadriseriata*. Neither of these can stand. The former is Brown's *C. alba*; the latter is Lindley's *C. angustata*. The fact that, in the case of this species, neither Bentham's synonyms nor his varieties can be accepted in no way casts any reflection upon the great botanist himself: it merely illustrates the difficulty in dealing with a variable species from dried material of plants which have never been seen alive.

It is unnecessary here to enter into any detailed account of the distinguishing features which warrant specific separation between *C. carnea*, *C. alba* and *C. angustata*, as this has been adequately provided by Nicholls in the "Review of Certain Species of *Caladenia*" cited above for *C. angustata*. Although now requiring certain amendments and additions, the whole of this illustrated review, covering about 17 species, is of great value for reference purposes (*Vict. Nat.*, xlvii, 1931, 155–161 and 179–183).

Bentham's description of *C. carnea* (l.c., 386) may be taken as providing all the salient features of the typical form, which is widely and abundantly distributed from about the latitude of Proserpine in Queensland, southward through New South Wales, Victoria, South Australia and Tasmania. The colour of the flowers varies from palest pink to bright rose. In some areas whitish flowers are quite common, but the white is never as pure as in *C. alba*. Sometimes the flowers are sweetly scented, sometimes they are quite scentless. In numbers they range from one to as many as six. The glandular calli on the labellum, both discal and marginal, are club-headed, the "clubs" usually being yellow.

So far as I can ascertain, eight named varieties have been described and published, in addition to Bentham's two excluded above:

1. *C. carnea* var. *gigantea* Rogers, *Trans. Roy. Soc. S. Aust.*, li, 1927, 13.
2. " " " *pygmaea* Rogers, l.c.
3. " " " *aurantiaca* Rogers, l.c., xlv, 1922, 154.
4. " " " *minor* (Hook, f.) Hatch, *Trans. Roy. Soc. N.Z.*, lxxv (3), 1945, 367.
5. " " " *exigua* (Cheesmn.) Rupp, these PROCEEDINGS, lxi, 1944, 74–5.
6. " " " *gracillima* Rupp, *Qd. Nat.*, xi (4), 1940, 86.
7. " " " *ornata* Nicholls, *Vict. Nat.*, lxii, 1945, 61, 63.
8. " " " *subulata* Nicholls, l.c.

Of these, I am unable to accept *C. carnea* var. *aurantiaca* Rogers as a true variety of *C. carnea*, and I propose here to raise it to specific rank—*C. aurantiaca*. My reasons for this proposal are as follows:

- (1). Both column and labellum are entirely devoid of transverse striae.
- (2). The column is about half as broad again as in any form of *C. carnea* known to me.
- (3). The labellum is practically lobeless.
- (4). There are no marginal calli on the labellum unless we can so call the irregularities of the margin near the apex; if we can, they are quite different from those of *C. carnea*.
- (5). Except for the small area of orange on the labellum, the flowers are as pure white as those of *C. alba*.

These distinctions seem to me quite as important as those which separate *C. carnea* from *C. alba*. *C. aurantiaca* is best known in Victoria; but some years ago I found it in abundance along the shores of the Myall Lakes, near Bungwahl, New South Wales, about 70 miles north of Newcastle, and it was collected by Mr. D. Cross at Calga, near Gosford, New South Wales, in September, 1945. At first, I had taken it to be a diminutive form of *C. alba* R.Br., and I am still disposed to think it closer to that species than to *C. carnea*; but a reference to Nicholls's plate (*Vict. Nat.*, xlvii, 1931, 160, Figs. v and vi) will show that here also there are important differences. The mid-lobe of the labellum as depicted by Nicholls does not quite agree with the original description by Rogers (l.c.); but some of the Bungwahl-Gosford specimens correspond with Nicholls's drawing precisely. A fuller description than has hitherto been given follows:

*CALADENIA AURANTIACA*, n. stat.

A small and very slender plant from 12 to 17 cm. high, with a very narrow-linear leaf rather more than half as long as the stem. Flower usually solitary, but occasionally two, the second on a filiform pedicel. Perianth segments white inside, conspicuously striped with green on the outside. Labellum pure white except the tip and the calli, which are deep, or sometimes bright, orange: entire or occasionally with obscure tendencies towards lobation, but never really lobed. Margins entire, or denticulate near the tip, the teeth irregular. Calli in two rows, with relatively large clavate heads and slender stalks. Column broader than in either *C. alba* or *C. carnea*, the wings also wider. No transverse striation on either labellum or column. Eastern Victoria and central to northern coastal districts of New South Wales.

The following notes are offered concerning the other seven varieties listed above.

1. *C. CARNEA* var. *GIGANTEA*.—The type form of this came from Bungwahl, New South Wales. However, it is widely distributed, having been recorded as far south as Airey's Inlet in Victoria (Nicholls). Northward it extends well into tropical Queensland, and Rogers expressed the opinion that it was identical with a Javanese form determined as *C. carnea*. It is a comparatively robust plant, seldom bearing more than two flowers; these range up to 5 cm. in diameter, and are usually bright rose-pink, with a strong musky perfume. The height ranges from about 18 to over 50 cm.

2. *C. CARNEA* var. *PYGMAEA*.—This form is in great contrast to the preceding, rarely exceeding 12 cm. in height. Plants often grow in clusters, especially on damp soil. The flower is usually solitary, very small, with deep reddish tints, especially on the under surface of the perianth segments. It is found chiefly in Victoria and Tasmania, but I have seen it once or twice in New South Wales.

3. *C. CARNEA* var. *MINOR*.—This is *Caladenia minor* Hook. f. (*Fl. Nov. Zel.*, i, 1853, 247). It is impossible to find any features distinguishing this plant from *C. carnea*. At one time I regarded it as scarcely differing from *C. carnea* var. *pygmaea*, and I included it in that form in these PROCEEDINGS, lxix, 1944, 74-5. But further material provided by E. D. Hatch of Auckland proved this a mistake; and Hatch has now published it as *C. carnea* var. *minor* (*Trans. Roy. Soc. N.Z.*, lxxv (3), 1945, 367). I have seen Australian specimens identical in all respects with those from New Zealand.

4. *C. CARNEA* var. *EXIGUA*.—Cheeseman first published this (*Trans. N.Z. Inst.*, xlv, 1913, 96) as a variety of *C. minor* Hook f. Subsequently (*Man. N.Z. Fl.*, 1925 ed.) he raised it to specific rank. It is, however, only a very diminutive form of *C. carnea*: structurally the only distinction I can find is the reduction of the marginal calli of the labellum to one on each side. I have collected this form at Longley in Tasmania and near the Hawkesbury River in New South Wales. It does not grow in clusters like *C. carnea* var. *pygmaea*, and the flowers are light pink.

5. *C. CARNEA* var. *GRACILLIMA*.—This very attractive form was found by the Rev. E. N. McKie near Yandina in southern Queensland. It is extremely slender, the flowers being bright pink, with narrow, almost acuminate sepals and petals. It is plentiful in the type locality, but I have not seen specimens from elsewhere.

6. *C. CARNEA* var. *ORNATA*.—A form from the Portland area in western Victoria, and perhaps the most beautiful member of the species. The labellum is brilliant red, traversed by darker striae across the broad lateral lobes. Very often the lateral sepals



are united from the base for about a third of their length. Nicholls states that the calli are occasionally gammate in shape, as in the Tasmanian *C. Longii* Rogers.

7. *C. CARNEA* var. *SUBULATA*.—This has some features in common with *C. carnea* var. *gracillima*; but the lateral sepals are conspicuously reflexed—a most unusual occurrence in this species; and the margins of the mid-lobe of the labellum are entire. It comes from the same area as *C. carnea* var. *ornata*.

In districts where both *C. carnea* and *C. alba* are plentiful, occasionally plants are found combining the characters of both, and therefore suggestive of natural hybridization. It is, however, rather surprising, in view of the close affinities between these two, that such cases are rare in proportion to the vast numbers of the plants. Near the Paterson River, in New South Wales, I found numerous specimens suggestive of *C. carnea* × *C. caerulea*. The flowers were solitary, pink, but with the labellum shaped like that of *C. caerulea*, to which further resemblance was manifested in the broad-linear, semi-prostrate leaf.

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